UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,743	02/25/2004	Douglas W. Akers	B-200	6111

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Alan D. Kirsch
BBWI
PO BOX 1625
IDAHO FALLS, ID 83415-3899

EXAMINER
PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 03/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/788,743	AKERS, DOUGLAS W.
	Examiner	Art Unit
	Rick Palabrica	3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 January 2006_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-10,12-19 and 21-23_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-10,12-19 and 21-23_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Applicant's 1/13/06 Amendment, which directly amended claims 2 and 13, and

traversed the rejection of the claims, is acknowledged

2.   Applicant's arguments that traversed the rejection of claims 1-10, 12-19 and 21-

23 under 35 U.S.C. 112, first and second paragraphs, have been fully considered but

found not convincing.

The examiner has raised several issues regarding the sufficiency of applicant's

disclosure, and has provided documentary evidence to support his reasoning.

Applicant's main argument is that it would not require undue experimentation to arrive

an operative embodiment of the applicant's invention. The examiner does not agree.

Note that the examiner's conclusions are based on all of the evidence of this case,

including the specifications and the drawings, as well as case law and the MPEP.

Applicant's claims require the use of algorithms (i.e., Doppler broadening and

positron lifetime), detector(s), a neutron source, and a data processor. Thus, to enable

an artisan to make and use an operative embodiment, one must first know which

particular algorithm(s) to use, and how and in what manner the data from the detectors

are to be analyzed in the "data processor."

It is the examiner's position that applicant's specification basically sets forth the

algorithms and data processor as "black boxes" without sufficient details of internals

thereof, to enable an artisan to make and use an operative embodiment of the

invention, <u>without undue experimentation.</u> See MPEP 2164.06 and *In re Ghiron*, 169 USPQ 723.

Note that an algorithm is a general mathematical <u>approximation</u> of a physical phenomenon. Different algorithms can be used to approximate the same physical event or phenomenon and, depending on the particular situation, circumstances, etc., one of these known algorithms will give a more accurate result than the others.

As an example, the specification indicates that there are different known Doppler broadening algorithms <u>but,</u> fails to disclose <u>which</u> of these known algorithms would be suitable for use in the present invention. Accordingly, due to this failure, one must resort to a trial-and-error process to determine which of the known algorithms to use and, such is considered undue experimentation.

This is especially so since all algorithms contain "constants" that are used to apply the algorithm to a "specific situation." These "constants" are based on various boundary conditions, etc., of the "specific situation" or, in mathematical terms, each of these "constants" are defined as a <u>function</u> of these boundary conditions, wherein different boundary conditions are given different weights and combined in a given manner (e.g., multiplied by a number (e.g., 3), squared, and then added together, etc.). The references discussed by the examiner in sections 8 and 9 above, provide clear examples of the functional dependencies of these constants to specific conditions where these algorithms are applied.

Thus, <u>before</u> one can even apply a given algorithm to a "specific situation", <u>one</u> <u>must first determine the mathematical equations</u> used to determine each of the "constants" in the given algorithm.

It is the examiner's position that neither the applicant's specification nor the art of record, provides an enabling disclosure of the particular mathematical equations to be used for determining <u>each</u> of the different "constants" in <u>each</u> of the different algorithms.

It is the examiner's position that it would be <u>undue experimentation</u> for an artisan to utilize a trial-and-error process to go through <u>all</u> of the possible mathematical equations (with all of the possible weighted boundary conditions, etc.) for <u>each</u> of the various known different Doppler broadening algorithms and for <u>each</u> of the various known different positron lifetime algorithms, to finally determine which one to use in applicant's invention. The examiner's conclusions are supported by MPEP 2164.06(a) and the case law cited therein. Applicant's illustration of block diagrams labeled data processing system, Doppler broadening algorithm and positron lifetime algorithm, with no description of internals thereof, is similar to the situation in *In re Ghiron* 169 USPQ 723. Applicant's case is also considered analogous to *In re Scarbrough* 182 USPQ 298, wherein Scarbrough had a claim directed to a system of several component parts referred to by a generic name and overall ultimate function. The court concluded that there was no enabling disclosure because the specification did not describe how "complex elements known to perform broadly recited functions in different systems would be adaptable for use in Applicant's particular system with only reasonable amount of experimentation."

   <u>While the above, by itself, is considered evidence of undue experimentation, one</u>

<u>is still not done!</u>

   Applicant's specification on page 8 refers to some of the characteristics of the

specimen that is desired for each algorithm to assess. Applicant's data processor

utilizes the algorithms to process the data from the detectors and then, in some

<u>undisclosed manner</u>, to further process the output of the algorithm to provide an

indication of the presence or absence of a <u>lattice defect</u> and/or "localized composition

changes", etc.. This indication is actually a <u>probability</u> of a lattice defect being present,

<u>since this is a non-destructive analysis</u>.

   If one sets the conditions too loosely, too many specimens will be inaccurately

indicated as having a lattice defect. On the other hand, if one sets the conditions too

tightly, the inventive system will inaccurately indicate too many specimens as not having

a lattice defect when they actually do. In the art of activation analysis, where the

claimed invention belongs, the boundary conditions have a profound effect on the

accuracy of the results. The situation for applicant's claimed invention is similar, for

example, to Schultz et al. (U.S. 5, 200,626) who disclose a method and an apparatus

for detecting hidden explosives by pulsed neutron and x-ray interrogation. They teach

that if the threshold level of the system is adjusted so as to detect small quantities of

nitrogen, then a <u>high false-positive rate</u> results due to the presence of innocent nitrogen

containing materials, leading to the necessity of searching an excessive number of

packages by hand. On the other hand, if the threshold level is set high to <u>avoid false</u>

positives, then the likelihood that actual explosives will escape detection, i.e., false

negatives, increases.

In addition, applicant's invention is not just the determination of the presence or

absence of just a single lattice defect, which, in itself, would not provide any useful

information, but rather, whether there are present enough lattice defects to cause metal

and fatigue, embrittlement, etc. (as indicated in applicant's specification).

Clearly, it is undue experimentation to determine a suitable data processor for

determining how and in what manner, the outputs from each of the algorithms is to be

processed so as to provide a reasonably accurate non-destructive determination as to

whether or not the specimen in question has sufficient lattice defects to be of concern

(as indicated in applicant's specification). Note that this is in addition to determining

which of the several known Doppler broadening algorithm and which of the several

positron lifetime algorithms should be used after going through a trial-and-error process

involving different mathematical equations with different weighted boundary conditions,

as already set forth above.

However, one is still not done!

The only way to determine whether or not the "chosen" specific Doppler

broadening algorithm, and the "chosen" specific positron lifetime algorithm, the "chosen"

manner of further manipulating or analyzing the output of the algorithm, actually

provides a reasonable determination of the presence of enough lattice defects to be of

concern, is by doing a further analysis of the specimen (such as a destructive

testing/analysis) to determine the actual quantity of said lattice defects present and

noting how closely the result of this <u>actual testing/analysis</u> correlates to the result from applicant's non-destructive analysis.

Further, to obtain <u>reasonable statistical analysis</u>, one would have to do this for a plurality of specimens. Clearly, such would present <u>undue</u> experimentation.

Additionally, applicant has some claims that require the presence of <u>both</u> a Doppler broadening algorithm and a positron lifetime algorithm, and which require the data processor in some <u>undisclosed</u> manner to combine the outputs of these algorithms to indicate a lattice defect.

First, the appropriate algorithm has to be selected from a plurality of available algorithms that applicant himself admits and as taught by the references cited by the examiner in the previous Office action. This selection has to be performed for each of the Doppler broadening algorithms, each of the positron lifetime algorithms, each of the 3D imaging algorithms, and each of the selective activation algorithms.

Next, the results of applying the algorithms have to be combined in order to produce an output data indicative of the presence or absence of a lattice defect. <u>Since applicant has refused to disclose how these algorithms have to be combined</u>, an artisan will have to determine by trial-and-error that may include hundreds or thousands of possible combinations, starting, for example, with 5% Doppler and 95% positron lifetime and up to 95% Doppler with 5% positron lifetime. Additionally, for each selected combination, the plurality of constants inherently associated with each selected algorithm has to be evaluated.

Then, the results of these hundreds or thousands of possible combinations must

be compared to the results from the above referred to as "destructive testing/analysis"

of each specimen to determine the manner of combining.

Additionally, applicant's specification on page 14 states that both the positron

lifetime algorithm and Doppler broadening algorithm, each requires two detectors . The

specification on page 20 also states that a single detector is used. Applicant's

disclosure is thus clearly insufficient and non-enabling as to which specific known

positron lifetime algorithm can be used with only a single detector and, which specific

Doppler broadening algorithm can be used with only a single detector.

Applicant shows in Fig. 2 that there is feedback between the data processing

system and each one of the elements, Doppler broadening algorithm and positron

lifetime algorithm. This feedback is indicated in Fig. 2 as double-headed arrows

between the data processing system and each of the two algorithms. There are no

details in the specification of how the parts should be interconnected, timed and

controlled so as to obtain the specific operations desired by the applicant (see, for

example, *In re Gunn* 190 USPQ 402, 406). Additionally, there is no discussion as to

what factors comprise the feedback for each one of the three specific elements, when

such feed back occurs, whether or not feedback to one algorithm also comes from the

other algorithm, etc. This feedback arrangement provides further proof of necessary

modification, consistent with the issue previously raised by the examiner. If no

modification of results were required, applicant would not have indicated this feedback

mechanism in his disclosure.

Applicant argues that his disclosure is enabling because the level of disclosure provided in his application is the same as those in Akers (U.S. 6,178,218) or Alex (U.S. 4,064,438). The examiner disagrees.

First, the issuance of the cited patents is not dispositive of the issues raised by the current examiner because his issues are different from those raised by another examiner who examined the application for the cited patents.

Second, the Doppler broadening algorithm in Akers (U.S. 6,178,218), is not modified by feed back from the data processing system and/or possibly the positron lifetime algorithm, unlike the instant application.

Third, as to Alex, his technique is completely different from the applicant's. He does not employ any positron lifetime algorithm or Doppler broadening algorithm in his invention to obtain indication of defects in specimens. Rather, the actual radioactivity-related measurements from the samples are compared with previously prepared reference standards. For example, Alex's non-destructive method for detecting hydrogen embrittlement develops energy distribution curves of gamma ray measurements from various classes of known levels of hydrogen embrittlement, to be utilized as reference standards to indicate the stage of unknown embrittlement within a specimen under examination (see col. 3, lines 55+).

Applicant also argues that his written description is enabling because: a) the positron lifetime algorithm is described in paragraphs 0043-0046; and, b) the Doppler broadening algorithm is described in paragraphs 0047-0049. The examiner disagrees.

The cited paragraphs merely mention either <u>the use or desired result</u> from using the

algorithms, which are completely different from "describing the algorithm."

As to applicant's argument that the disclosure of the instant application is at the

same level as the disclosure in a related patent application (S/N 10/269,807) that a

previous Board found to be sufficient, the additional evidence herein presented by the

examiner to further support his position were not available to said Board.

In summary, the examiner has demonstrated above that applicant's disclosure is

insufficient and non-enabling, and that undue experimentation would be required by an

artisan to make and use an operative embodiment of applicant's claimed invention. The

examiner's position is supported by the following sections of the MPEP and the case

laws cited therein.

2164.06(a) Examples of Enablement Issues-Missing Information

"It is common that doubt arises about enablement because information is missing about one or more essential parts or relationships between parts which one skilled in the art could not develop without undue experimentation.

I.   ELECTRICAL AND MECHANICAL DEVICES OR PROCESSES

For example, a disclosure of an electrical circuit apparatus, depicted in the drawings by block diagrams with functional labels, was held to be nonenabling in *In re Gunn*, 537 F.2d 1123, 1129, 190 USPQ 402, 406 (CCPA 1976). There was no indication in the specification as to whether the parts represented by boxes were "off the shelf" or must be specifically constructed or modified for applicant's system. Also there were no details in the specification of how the parts should be interconnected, timed and controlled so as to obtain the specific operations desired by the applicant.

In re Ghiron, 442 F.2d 985, 169 USPQ 723 (CCPA 1971), involved a method of facilitating transfers from one subset of program instructions to another which required modification of prior art "overlap mode" computers. The Board rejected the claims on the basis, *inter alia*, that the disclosure was insufficient to satisfy the requirements of <u>35 U.S.C. 112</u>, first paragraph and was affirmed. The Board focused on the fact that the drawings were "block diagrams, i.e., a group of rectangles representing the elements of the system, functionally labeled and interconnected by lines." 442 F.2d at 991, 169 USPQ at 727. The specification did not particularly identify each of the elements represented by the blocks or the relationship therebetween, nor did it specify particular apparatus intended to carry out each function.

An adequate disclosure of a device may require details of how complex components are constructed and perform the desired function. The claim before the court in *In re Scarbrough*, 500 F.2d 560, 182 USPQ 298 (CCPA 1974) was directed to a system which comprised several component parts (e.g., computer, timing and control mechanism, A/D converter, etc.) only by generic name and overall ultimate function. The court concluded that there was not an enabling disclosure because the specification did not describe how "complex elements known to perform broadly recited functions in different systems would be adaptable for use in Applicant's particular system with only a reasonable amount of experimentation" and that "an unreasonable amount of work would be required to arrive at the detailed relationships applicant says that he has solved." 500F.2d at 566, 182 USPQ at 302.

2164.06 Quantity of Experimentation - 2100 Patentability

II.   EXAMPLE OF UNREASONABLE EXPERIMENTATION

In *In re Ghiron*, 442 F.2d 985, 991-92, 169 USPQ 723, 727-28 (CCPA 1971), functional "block diagrams" were insufficient to enable a person skilled in the art to practice the claimed invention with only a reasonable degree of experimentation because the claimed invention required a "modification to prior art overlap computers," and because "many of the components which applicants illustrate as rectangles in their drawing necessarily are themselves complex assemblages . . . "

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3.   Claims 1-10, 12-19 and 21-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The reasons are the same as those stated in section 4 of the 10/17/05 Office

action, as further clarified in section 2 above, which reasons are incorporated herein.

4.   Claims 1-10, 12-19 and 21-23 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention.

The claims are vague and indefinite, and their metes and bounds cannot be

determined. The reason is the same as that given in section 5 of the 10/17/05 Office

action, as further clarified in section 2 above, which reason is herein incorporated.

Double Patenting

Claim Rejections – Double Patenting

The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11
F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225
USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA
1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*,
418 F.2d 528, 163 USPQ 644 (CCPA 1969).
     A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be
used to overcome an actual or provisional rejection based on a nonstatutory double
patenting ground provided the conflicting application or patent is shown to be commonly
owned with this application. See 37 CFR 1.130(b).
     Effective January 1, 1994, a registered attorney or agent of record may sign a
terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with
37 CFR 3.73(b).

5.   Claim 2 is provisionally rejected under the judicially created doctrine of double

patenting over claim 3 of copending Application No. 10/383,096. This is a provisional

double patenting rejection since the conflicting claims have not yet been patented.

The reason is the same as that given in section 6 of the 10/17/05 Office action,

which reason is herein incorporated.

The examiner notes that the applicant agrees with this rejection.

Conclusion

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Rick Palabrica whose telephone number is 571-272-

6880. The examiner can normally be reached on 6:30-5:00, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

RJP
February 20, 2006